AMENDMENTS TO THE CLAIMS

Please amend the presently pending claims as follows:

1. (Canceled)

2. (Currently Amended) The transmission method according to claim ~~1~~ 4, wherein said bank of synthesis filters ~~and/or of said bank of analysis filters are~~ is grouped as a polyphase matrix, respectively.

3. (Previously Presented) The transmission method according to claim 2, wherein at least one of said polyphase matrices comprises a reverse Fourier transform- with 2M inputs and 2M outputs.

4. (Currently Amended) A method for modulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal, wherein a bank of synthesis filters are implemented, having 2M parallel branches, wherein M is an integer parameter and $M \geq 2$, each branch of synthesis filters being fed by source data and each comprising an expander of order M and a synthesis filter, which is derived from a predetermined prototype modulation function,
said method performing the following steps:

- a multiplication by $e^{j\frac{\pi}{2}n}$ of each of said source data, providing multiplied source data;
- applying a predetermined phase shift to each source data of a set of 2M multiplied source data, wherein said predetermined phase shift is $D = \alpha M - \beta$,- with α an integer representing a reconstruction delay and β an integer between 0 and M-1,
~~The modulating method according to claim 12, wherein the method implements~~ implementing a reverse Fourier transform fed by the set of 2M source data having undergone the predetermined phase shift,
- feeding 2M ~~filtering modules~~ synthesis filters with outputs of said reverse Fourier transform,
- expansion of order M of outputs of said synthesis filters, providing synthesis filter outputs,

- grouping said synthesis filter outputs, and

- transmitting the grouped synthesis filter outputs.

~~each followed by an expander of order M, the outputs of which are grouped then transmitted.~~

5. (Previously Presented) The modulation method according to claim 4, wherein the method delivers data s[k] such that:

$$x_m^n(n) = a_{m,n} e^{j\frac{\pi}{2}n}$$

$$x_l^1(n) = \sqrt{2}\sum_{k=0}^{2M-1} x_k^0(n) e^{j\frac{2\pi}{2M}k\frac{D-M}{2}} e^{j\frac{2\pi}{2M}kl}$$

$$= 2M\sqrt{2}IFFT\left(x_0^0,\ldots,x_{2M-1}^0(n)e^{-j\frac{2\pi}{2M}(2M-1)\frac{D-M}{2}}.\right)[l]$$

$$x_l^2(n) = \sum_{k=0}^{m=\lfloor \frac{l}{M} \rfloor} p(l+2kM)x_k^l(n-2k)$$

$$s[k] = \sum_{n=\left\lfloor \frac{k}{M} \right\rfloor - 1}^{\left\lfloor \frac{k}{M} \right\rfloor} x_{k-nM}^2(n)$$

wherein D = αM - β,

with α an integer representing the reconstruction delay;

β an integer between 0 and M-1;

and [.] is the "integral part" function.

6. (Currently Amended) A method comprising demodulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal wherein a bank of analysis filters are implemented having 2M parallel branches, wherein M is an integer parameter and M ≥ 2, each branch of analysis filters comprising a decimator of order M and an analysis filter, and delivering representative data received from source data, said analysis filter being derived from a predetermined prototype modulation function,

and performing~~The demodulating method according to claim 15, wherein the method implements~~ the following steps:

- receiving of a transmitted signal mai~~d~~de of inputs,

- grouping said inputs,

- decimation of order M of said inputs,

- feeding 2M analysis filters with an output of decimation of order M,

- feeding 2M phase shift multipliers with outputs of the 2M analysis filters, delivering phase-shifted outputs corresponding to a multiplication of said outputs of the 2M analysis filters by $e^{-j\frac{2\pi}{2M}l\frac{D+M}{2}}$, wherein D is a predetermined phase shift such as D = 2.s.M + d, wherein s is an integer and d is an integer between 0 and 2M-1,

- ~~a~~ implementing a reverse Fourier transform fed by 2M branches, themselves fed by said phase-shifted outputs ~~transmitted signal, each comprising a decimator of order M followed by a filtering module, and feeding 2M phase shift multipliers~~, delivering an estimation of the source data.

7. (Previously Presented) The demodulation method according to claim 6, wherein the methods delivers data $\hat{a}_{m,n-\alpha}$ such that:

$$\hat{x}_l^2(n-\alpha) = s[nM - \beta - l]$$

$$\hat{x}_l^1(n-\alpha) = \sum_{k=0}^{m-1} p(l+2kM)\hat{x}_l^2(n-\alpha-2k)$$

$$\hat{x}_l^0(n-\alpha) = \sqrt{2}e^{-j\frac{2\pi}{2M}l\frac{D+M}{2}} \sum_{k=0}^{2M-1} \hat{x}_l^1(n-\alpha)e^{j\frac{2\pi}{2M}kl}$$

$$= 2M\sqrt{2}e^{-j\frac{2\pi}{2M}l\frac{D+M}{2}} IFFT\left(\hat{x}_l^1(n-\alpha),\ldots,\hat{x}_{2M-1}^1(n-\alpha)\right)[l]$$

—

$$\hat{a}_{m,n-\alpha} = \Re\left\{e^{-j\frac{\pi}{2}(n-\alpha)}x_l^0(n-\alpha)\right\}$$

with: D = 2.s.M + d,

wherein: s is an integer;

d is between 0 and 2M-1.

8. (Currently Amended) The demodulation method according to claim 6~~15~~, wherein said filtering modules are produced as one of the filters belonging to the group comprising:

transverse structure filters;

ladder structure filters; and

trellis structure filters.

9. (Currently Amended) The modulation method according to claim 6 ~~15~~, wherein said biorthogonal multicarrier signal is a OFDM/OM signal.

10. (Canceled).

11. (Currently Amended) The method according to claim 4~~1~~, wherein said biorthogonal multicarrier signal is an orthogonal frequency division multiplex/offset modulation (OFDM/OM) signal.

12. (Canceled)

13. (Currently Amended) The modulation method according to claim 4~~12~~, wherein said synthesis filters~~filtering modules~~ are produced as one of the filters belonging to the group comprising:

transverse structure filters;

ladder structure filters; and

trellis structure filters.

14. (Currently Amended) The method according to claim 4~~12~~, wherein said biorthogonal

multicarrier signal is an OFDM/OM signal.

15. (Canceled)

16. (Currently Amended) Apparatus comprising:

a modulating device for modulating a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal, comprising a bank of synthesis filters having 2M parallel branches, wherein M is an integer parameter and $M \geq 2$, each branch of synthesis filters being fed by source data and each comprising an expander of order M and a synthesis filter, which is derived from a predetermined prototype modulation function,

and performing:

- a multiplication by $e^{i\frac{\pi}{2}n}$ of each of said source data, providing multiplied source data;
- applying a predetermined phase shift to each source data of a set of 2M multiplied source data, wherein said predetermined phase shift is $D = \alpha M - \beta$, with α an integer representing a reconstruction delay and β an integer between 0 and M-1,
- reverse Fourier transform fed by the set of 2M source data having undergone the predetermined phase shift,
- feeding 2M synthesis filters with the outputs of said reverse Fourier transform,
- expansion of order M of the outputs of said synthesis filters, providing outputs,
- grouping said outputs, and
- transmitting the grouped outputs.

17. (Canceled)

18. (Currently Amended) The apparatus according to claim 16, further including a demodulation device for demodulating a BFDM/OM biorthogonal multicarrier signal and comprising:

a bank of analysis filters having 2M parallel branches, each comprising an expander of order M and an analysis filter, and delivering representative data received from source data, said analysis filter being derived from a predetermined prototype modulation function,

and performing :

- receiving of a transmitted signal made of inputs,

- grouping said inputs,

- decimation of order M of said inputs,

- feeding 2M analysis filters with an output of decimation of order M,

- feeding 2M phase shift multipliers with outputs of the 2M analysis filters, delivering phase-shifted outputs corresponding to a multiplication of said outputs of the 2M analysis filters by $e^{-j\frac{2\pi}{2M}i\frac{D+M}{2}}$, wherein D is a predetermined phase shift such as D = 2.s.M + d, wherein s is an integer and d is an integer between 0 and 2M-1,

- reverse Fourier transform fed by 2M branches, themselves fed by said phase-shifted outputs, delivering an estimation of the source data.~~,~~

19. (Canceled)

20. (Currently Amended) A demodulation device for demodulation a biorthogonal frequency division multiplex/offset modulation (BFDM/OM) biorthogonal multicarrier signal comprising:

a bank of analysis filters having 2M parallel branches, each branch of the bank of analysis filters comprising a decimator of order M and an analysis filter, and delivering representative data received from source data, said analysis filter being derived from a predetermined prototype modulation function,

and performing :

- receiving of a transmitted signal made of inputs,

- grouping said inputs,

- decimation of order M of said inputs,

- feeding 2M analysis filters with the output of decimation of order M,

- feeding 2M phase shift multipliers with the outputs of the 2M analysis filters, delivering phase-shifted outputs corresponding to a multiplication of said outputs of the 2M analysis filters by $e^{-j\frac{2\pi}{2M}i\frac{D+M}{2}}$, wherein D is a predetermined phase shift such as D = 2.s.M + d, wherein s is an integer and d is an integer between 0 and 2M-1,

- reverse Fourier transform fed by 2M branches, themselves fed by said phase-shifted outputs, delivering an estimation of the source data.

21. (Cancelled).

22. (New) The transmission method according to claim 6, wherein said bank of analysis filters is grouped as a polyphase matrix, respectively.

23. (New) The method according to claim 6, wherein said biorthogonal multicarrier signal is an orthogonal frequency division multiplex/offset modulation (OFDM/OM) signal.